THE CONDOR

A Magazine of Western Ornithology

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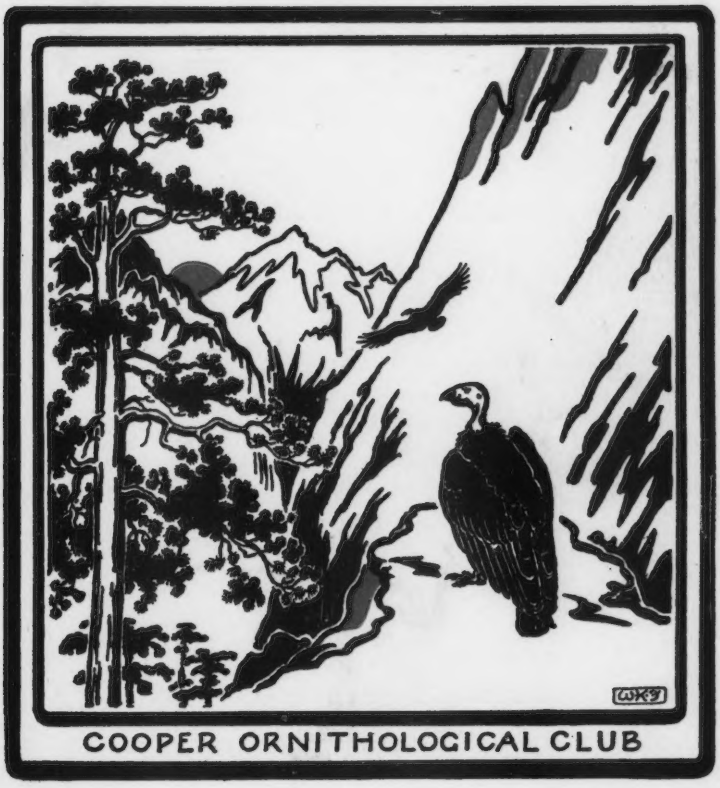

COOPER ORNITHOLOGICAL CLUB

THE CONDOR

A Magazine of Western Ornithology

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THE CONDOR

VOLUME XXXIX NOVEMBER-DECEMBER, 1937 NUMBER 6

THE McCOWN LONGSPURS OF A MONTANA PRAIRIE

WITH THREE ILLUSTRATIONS

By A. DAWES DuBOIS

Intent upon getting water from the nearest well by the shortest route, I was crossing a fenced quarter section of prairie on April 18, 1915, when a gray bird attracted me by his neighborly demeanor. He stood on the ground, singing his song within a few feet of me. When I stopped walking he only glanced up at me and sang again. Here was a bird worth knowing! Stranger though he was, his black cap, white throat, rich black patch on the breast, reddish brown "shoulder," white-edged tail, and short stout bill soon made known his identity. Later that day I came upon several others. It was not long until the McCown Longspur (*Rhynchophanes mccowni*) had become my favorite bird neighbor.

During the nesting season, in the locality referred to, on the prairie of Teton County, Montana, these longspurs were fully as numerous as Desert Horned Larks, and much more abundant and more evenly distributed than Chestnut-collared Longspurs (*Calcarius ornatus*). They made their homes on the high, dry portions of the prairie where the grass was too short to suit *Calcarius*. In such places, with few exceptions, they shared their dominion only with the horned larks.

In the spring migrations, McCown Longspurs began to arrive about the middle of April. The dates for four years were as follows:

First year (1915): Several arrived April 18; common April 20; few present May 2; again common May 3; abundant May 4 and thereafter.

Second year: First arrived April 14; common April 18; less numerous April 22 and 23; abundant April 25; common April 26 and thereafter.

Third year: First arrived April 13; maximum numbers by April 26, but never became abundant.

Fourth year: Heard flying over (bound for more northern breeding grounds) April 11; local summer residents arrived April 15.

The noticeable decrease in numbers the third year was believed to be due to the destructive storms of the preceding summer, and in part, also, to the encroachments of settlers who were breaking up broad stretches of the native prairie grass.

Observations of the fall migrations were meager, being hindered by the wandering disposition of the flocks, which form and shift from place to place after the young are on the wing. In the fall of the first year, I was absent until the 8th of October. In the second year these birds were not noted in August, though I looked for them especially on the 28th. The next year I saw a male on the 18th of August.

The female McCown Longspur (fig. 63) is a bird of no prominent marks, except for the white in the tail. At a nest where the bird permitted close observation, these notes were made from life: The upper surface of the head is uniformly covered with faint, fine,

wavy streaks, made up of buffy or light grayish-brown feather edgings on a darker gray-brown background. The face has a buffy appearance, with a line over the eye that is more whitish. A darker line extends backward from the eye, and another one backward from the lower mandible. The throat is white. There is just a faint suggestion of darker gray on the breast where the black patch adorns the male. The wrist of her wing shows a little of the reddish brown "shoulder" patch worn by her mate. There are no white marks on the outer surface of the wing, but only a pair of obscure buffy wing bars. When the bird takes flight, she shows, conspicuously, an almost black T-shaped design at the end of the white, spread tail. The sexes are alike in this tail pattern, which constitutes the best field mark (see DuBois, Condor, vol. 39, 1937, p. 104).

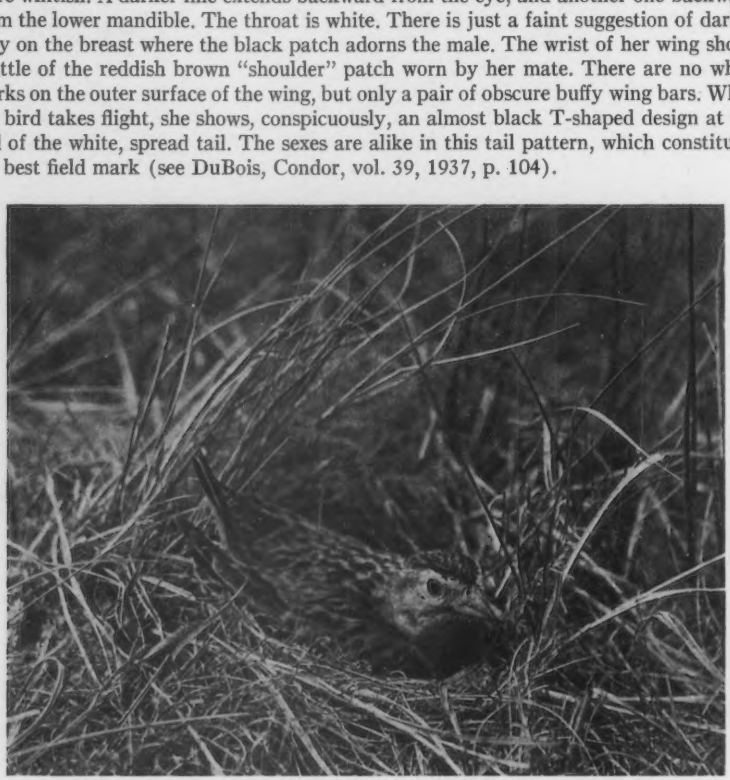

Fig. 63. Female McCown Longspur, incubating; photographed July 5, 1918, at nest 58.

The usual song of the McCown Longspur is a variety of warbles, clear and sweet. It is a joyous song. In the height of the nesting season it ripples through the air from many directions. It is usually delivered in course of a special flight.

The song-flight is a charming feat of grace. The male bird flies from the ground, in gradual ascent, to a height of perhaps six or eight yards, then spreads his white-lined wings, stretching them outward and upward, and floats slowly down to earth like a fairy parachute made buoyant with music. He continues to pour forth his song all the way down into the grass, and seems to swell with the rapture of his performance. Sometimes the descent is perfectly vertical. The song is delivered both while fluttering the wings and while making the parachute descent. The birds let their legs hang down beneath them while in flight. The floating descent was unique in my experience with birds, for though the Chestnut-collared Longspur also has a song-flight, it lacks the parachute descent.

Occasionally, while the bird is in the air, he utters a trio of staccato notes, each of decidedly different pitch, and separated by equal time intervals. The three notes are louder than the usual song; they are so short and clear, and have so pronounced a pause between them that the effect is very striking.

After a storm has passed and left the prairie dripping, and when the clouds are dispersing and the sun has come through, the entire population of longspurs and horned larks becomes united in a song of triumph. On one such occasion, in early June, I watched a very pretty demonstration. The day had turned partly clear after a cold driving rainstorm of thirty-six hours' duration; the birds were in exuberant spirits. On the ground, a short distance away, a male McCown Longspur pranced around his mate in a circle of about one foot radius, holding the nearer wing stretched vertically upward to its utmost, like the sail of a sloop, showing her its pure white lining, while he poured forth an ecstatic song.

At another time I saw a male standing at rest on a rock, holding one wing aloft and singing softly. Presumably his mate was in the grass near by. But the wing is not always lifted during the private musical salutations. A photograph of a male standing at rest on his rock was taken while he was singing so softly that the notes were just audible to me, a few yards away. His spouse was on the nest some twenty feet in front of him. The same day I saw a female raise both wings and hold them quivering; and immediately her mate ran past her, singing, and hoisting his white sail on the side toward her.

Three weeks from the day of first acquaintance with the species, a female jumped up, almost at my feet, disclosing a nest with four eggs. Had she sat tight she would not have been discovered. The nest itself was not easy to see. Dry grass blades hung loosely over it from the west. It is surprising how few such blades are necessary to make an effective

Fig. 64. Male McCown Longspur panting in the sun on lookout rock near nest 59; photographed July 6, 1918.

camouflage. This was the first of sixty-one nests to come to my attention in the course of four successive years. They have been described, with dates and other related details, in the Condor (vol. 37, 1935, pp. 64–68).

The nests were usually discovered by flushing the sitting female. This will occur occasionally as one walks across the prairie in the conduct of his daily affairs. The bird may be joined by her mate after she leaves the nest. Sometimes she sits closely, flushing only at the traveler's feet; or she may allow him to pass quite close to her without leaving the nest, provided his gaze does not betray his knowledge of her presence. At only one nest were the birds not seen. There was a certain female who was sometimes absent when I examined her nest, but who disclosed her solicitude on one occasion by flying overhead. Even if the nest is found before the female has begun sitting, a little observation will usually reveal one or both of the birds not far away.

Often the male may be seen near the nest when the female is incubating, or after she has left the eggs. One male fluttered over my head as I sat on the ground examining his nest. Sometimes the male will make his parachute descent near the visitor; or he may only stand on a fence post to watch. One master of the premises stood on a near-by rock nonchalantly singing a little song.

I found one female who resorted to an artifice similar to that of the Desert Horned Larks. After I had flushed her from the eggs, and had been seated for some time at the nest, she approached and deported herself very much as do the larks, running in the grass and pretending to hunt food, while she watched me. There is a great difference in individuals in regard to timidity or confidence displayed toward a human intruder. I once knew an intrepid female who went into her nest, to shelter the eggs from a shower, while I stood almost directly over it.

The parents become very solicitous for young that have left the nest. When I caught a fledgling near nest 59 (see list of nests, *op. cit.*, p. 65), on the day that it left, its father flew at my head, excitedly singing the trio of notes that is so characteristic. One day I managed to catch a youngster that was an excellent runner. Upon turning it loose I gave forth the most distressing squeaks of which I was capable. Quickly five adults appeared upon the scene and tried to lead me away. They alighted approximately in a row, well deployed, as though for battle; and when I followed, they all ran through the grass ahead of me, in company front, in a manner which was very amusing.

The usual complement of eggs was found to be either three or four. Clutches of five were rare. The eggs are deposited at the rate of one each day; at a nest which I visited both morning and evening, they were laid before 6:00 or 7:00 a.m. Incubation begins when the last egg is laid. A drilled egg, cautiously probed with a green grass stem, was returned to a nest and hatched a day or two afterward. The experiment was repeated at another nest where incubation seemed advanced. One of the three eggs was drilled May 30; six days later all three had recently hatched.

The female does all the incubating; I have never seen a male on the nest before hatching time. But after the young have arrived, the male is as busy as his spouse with the care of them. He does his part in sheltering them as well as in providing food. The young are given solid food from the beginning. At the nests observed most closely (nos. 58 and 59), grasshoppers made up by far the greater part of the diet, with now and then a moth or caterpillar, and small stuff the identity of which could not be determined. During the first days the parents swallow excrement taken from the young, but later this is carried away in the bill and dropped. On one occasion I saw a mother bird remove a large weed stem from the nest and fly away with it; soon afterward she removed from the bottom of the nest a small stem with excrement adhering to it.

Fig. 65. Male McCown Longspur feeding nestlings at nest 59; photographed July 12, 1918.

The female sometimes sings at her nest when her mate is approaching. An account of nest life observed from a blind, at nest 58, and details of behavior noted at nest 59, were published in Bird-Lore in March, 1923 (vol. 25, pp. 95–105).

The newly hatched young, as soon as dry, are protected above by fluffy natal down, about one-fourth inch long, of a whitish buff or pale dead-grass color similar to that of young Desert Horned Larks. The invisibility afforded by this covering is truly marvelous. The skin is light-colored but reddish. The tongue and inside of the mouth are of a strong pink color, without spots or marks of any kind. This distinguishes them from young of Desert Horned Larks (see Condor, vol. 38, 1936, p. 56).

When the nestlings are four days old, the feathers of their underparts become well sprouted, forming a longitudinal band along each side. When six days old, the natal down of the upper parts has been pushed out on the feather tips so that the covering is a combination of down and feathers. The young are well feathered at the age of eight or nine days. They leave the nest at the age of ten, when they can run at a lively rate, fluttering their wings if pursued. Two days later (age 12 days), as observed at nest 59, they are able to fly for short distances.

There were times when the appearance of a hawk soaring overhead, for example, a Ferruginous Rough-leg, caused a great commotion among the small terrestrial birds; but such occasions were quite unusual. The birds paid little attention to the Short-eared Owls and Marsh Hawks that hunted around the meadows in the vicinity. Raptorial birds in general were believed to be almost negligible factors in the lives of the longspurs at this place, though carcasses of fledglings were seen at a Short-eared Owls' nest, and at a nest of Swainson Hawks near the river several miles north.

Punctured eggs or broken shells showing tooth marks, noted in several instances, were thought to be the work of the common ground squirrels, though I never caught

one of these rodents in the act of plundering a nest. Whenever a ground squirrel approached a nest, the longspurs drove him away by swooping at him repeatedly, sometimes actually striking his back. Many nests were of course plowed under by the breaking plows of pioneer farmers. I have seen one or two go over with the turning sod, when it was too late to prevent it.

Of the night marauders very little was ascertained. Skunks and weasels played their part. Barbed wire fences, a source of danger to the horned larks, seemed not to menace the longspurs, probably because the latter are not given to rapid flights at low elevations.

Protracted rainstorms and late spring snows were by far the most destructive of all the mishaps which befell the young. Four days after a very destructive rainstorm I found one nest of McCown Longspur containing two living nestlings; but they were not many days old and probably had been in the egg shells during the downpour.

There was a deep fall of snow on May 25 of the second year, that ceased early on the 26th. I had previously marked a nest in which the bird was known to have begun incubating her four eggs on the morning of the 19th. The snow covered everything so completely that I could not find my marker; but in the afternoon of the 26th the marker-rock showed through the melting snow, and I uncovered the nest. The eggs had been in cold storage all of one day and part of another; but an hour or two after the nest was uncovered the female was sitting on the eggs. She continued to incubate until the 8th of June. That day she was absent morning and evening, though in the nest at noon. Before my return early the next morning the eggs and nest had been mysteriously destroyed. The bird had continued incubation about nine days beyond the normal period. Perhaps it was her first experience with eggs under the snow.

Excelsior, Minnesota, January 15, 1937.

MIGRATORY BEHAVIOR OF SOME GLAUCOUS-WINGED GULLS IN THE STRAIT OF GEORGIA, BRITISH COLUMBIA

WITH MAP

By G. D. SPROT

The recoveries of banded Glaucous-winged Gulls (*Larus glaucescens*) from the vicinity of the Strait of Georgia, British Columbia, that are dealt with in this article number 68, of which 12 are of birds more than 4 years old. Twenty-seven are from 665 birds banded by Mr. Theed Pearse between 1922 and 1931 on Mittlenatch Island; 4 are from 225 birds banded by Mr. Kenneth Alexander between 1926 and 1931 on Gull Island, Howe Sound; and 37 are from 590 banded by myself, with occasional help, between 1929 and 1934 on Bare and Yellow islands, Haro Straits.

Immature Mortality.—There is the same heavy mortality among Glaucous-winged Gulls up to three years of age as has been reported among the young of Herring Gulls and some other species of sea birds on the Atlantic coast of North America and in Europe. For 56 birds under 4 years of age, the casualty list is as follows:

Under 10 months	31
10 months and under 2 years	12
2 years and under 3 years	12
3 years and under 4 years	1

Winter and Spring Movements of Adults.—The 7 winter recoveries of birds over 4 years of age, banded as nestlings, are too few to permit any definite statement in regard to the migratory behavior of adults. About all that can be said is that there are indications of a dispersal (see dots marked A on map), to no great distance, in September.

My observations along stretches of the sea shore have led me to believe that some birds of this species, both adult and immature, take possession in winter of a certain area of beach or bay. They permit other gulls to come and go, yet resent any effort on the part of visiting individuals to feed in the vicinity or to make use of the owners' favorite perches, such as rock pinnacles, launch masts, and boathouse roofs. Colored bands would be useful in deciding whether my interpretation of the observed antagonistic behavior of individuals seen in the same spots throughout a great part of the winter is correct, and if so, whether these same birds return to occupy the same territory each winter.

An adult, banded as an adult by Theed Pearse in winter, is the only recovery of this class reported after one year following the date of banding. This bird returned the following winter to near where it was trapped and banded.

By nature, the Glaucous-winged Gull is not as sociable as are some other species of gulls, so that local concentrations of birds of this species can almost always be associated with abundance of food. Concentrations in winter are usually confined to a few rivers, bays or harbors, and do not interfere with the normal life of numbers of solitary individuals to be found in the many small sheltered bays elsewhere in this region; nor do they appear to interfere with the minor territorial rights of some individual birds in the large harbors where concentrations are most in evidence. In these latter places, as boat owners have informed me, and as I have observed for myself, a single bird of any age will occasionally attach itself to some small craft at anchor and guard its possession against all comers. Should the boat put to sea for several months, on its return to harbor it will often instantly be boarded by the same bird. I have already recorded an instance of this (Canadian Field Nat., vol. 47, 1933, p. 76), and I know of several others.

Summer and Autumn Movements of Adults.—Two of the four adults banded as nestlings that were recovered in the breeding season (ages 4, 5, and 7 years) were found over 100 miles, and a third over 80 miles, from their birthplaces, while the fourth bird was picked up about 15 miles north of where it was hatched.

From observations on the breeding grounds, it is generally assumed that adults of this species return annually to the same island to breed, but there is nothing at present to show that adults banded as nestlings return to their birthplaces for that purpose. From the reports of banders in this area, no adults banded as nestlings have ever been observed in the vicinity of their birthplaces in the breeding season. Negative information in this instance, however, is probably worth little when we take into consideration the heavy mortality among birds of less than breeding age and the small number of summer recoveries of adults or of banded adults that it would be possible to observe even under the most favorable circumstances. Furthermore it is not known whether the few summer adult recoveries were of actually breeding birds.

The habit of odd pairs of Glaucous-winged Gulls, of nesting in isolated spots, in some cases far from others of their own species, is not uncommon, and the exceptionally high nesting population of late years in this region may be a reason for this. It remains possible, then, that adults, banded as nestlings, do not often return to their birthplaces to breed, although prior to the protection, and consequent exceptional abundance of the species, they may at least have attempted to do so. Until more of the species are banded, the behavior of adults must remain somewhat obscure.

Winter and Spring Movements of Immatures.—The movements of immatures are more clearly indicated. The behavior of a young gull of about eight months' age, found in a starving condition near my home, and which later visited my garden daily, indicates a probable local dispersal of immatures about the end of April with a return to winter quarters about the middle of November. This bird made its first appearance in late February, 1933; it left on May 28 and returned November 20 of the same year; it left for the second time April 29, 1934, but returned again November 3 of the same year;

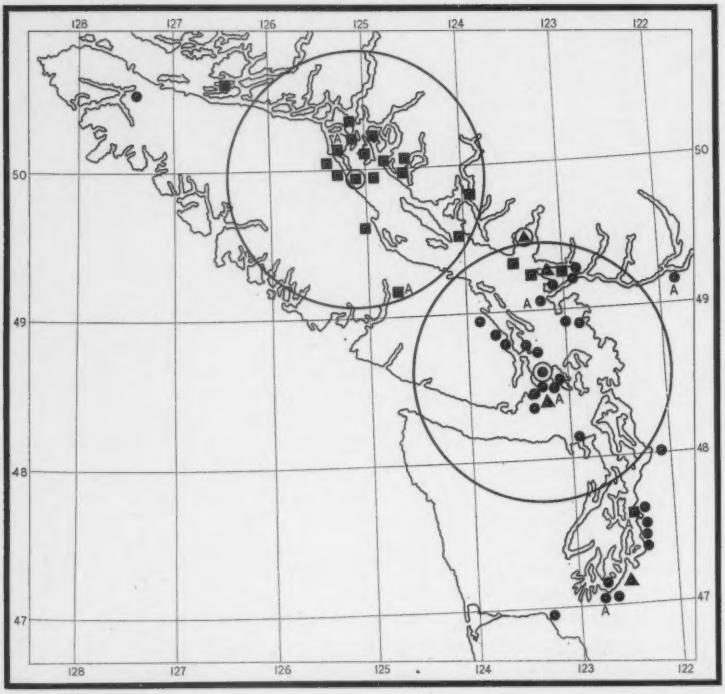

Fig. 66. Winter distribution of Glaucous-winged Gulls banded at nesting colonies in the Strait of Georgia, British Columbia. Squares represent birds from Mittlenatch Island; triangles, Gull Island; dots, Bare and Yellow islands. Locations of breeding colonies shown by symbols in small circles. The letter "A" denotes adult recoveries. Large circles show 60-mile radius.

it left for the third time April 17, 1935, and returned when 3 years and 5 months old, November 17, 1935. Unfortunately I was away from home for some time following its last return and the bird was not heard from again.

The map (fig. 66) shows clearly that the majority of birds up to 4 years of age remain in winter within a radius of about 60 miles of their individual birthplaces. Of 51 winter recoveries, 33 birds (30 immatures—21 under 1 year, and 9 over 1 yet under 3 years—plus 3 adults) were taken inside the 60-mile circle surrounding their birthplaces. Of 8 birds caught and released, discarding one the locality of which was given as "near Vancouver Island," 7 were taken well within 70 miles, in fact all except one well within 60 miles, of their individual birthplaces. The ages of these birds ranged from 5 months to 4 years and 8 months. Six, or 7 including the one previously discarded, were taken in the months of February, May, November, and December on board local coastal boats. These latter records suggest that a bird accompanying a ship in these waters rarely follows it beyond a certain point within the limits of a somewhat restricted range.

Overlapping of the winter (and summer) range of birds of Gull, and of Bare and Yellow islands is to be expected, but it will be noted that there is very little overlapping of these southern areas by the Mittlenatch birds. Mittlenatch Island lies about 90 miles

northwest of Gull and 120 miles northwest of Bare and Yellow islands, while the distance between Gull and the last two mentioned islands is about 60 miles.

The positions of the dots on the map representing recoveries suggest that shelter is one, if not the chief, requirement of this species in winter. Unfortunately there has been no banding of Glaucous-winged Gulls on the exposed west coasts of British Columbia and Washington. It might be found that there is a more extensive dispersal, or migration southward of these birds of the outer coast, perhaps to the sheltered Gulf of California.

Summer and Autumn Movements of Immatures.—The distance to which young gulls become dispersed can not be great, for of 10 immatures recovered in summer, 6 of various ages were found within 70 miles of their own birthplaces. Those birds exceeding the normal limit, or deviating from the general direction of the dispersal are listed below, with age, the locality where recovered, and the direction and distance from the nesting ground.

Mittlenatch Island		
6 months . .	Simoon Sound, B. C.	N 90 miles
Bare and Yellow islands		
4 months . .	Port Alice, V. I., B. C.	N 220 miles
1 year and 1 month	Linnton, Oregon	S 210 miles
2 years . . .	Port Hardy, V. I., B. C.	N 240 miles

Although 3 of these 4 birds went north instead of south, there is nothing here to indicate a northerly drift prior to the regular southerly migration, as is occasionally undertaken by odd individuals of some other species of birds. On the contrary, one is more justified in assuming that birds recovered from distant points in their second and third years actually reached those points in their first autumn, and remained in the vicinity of those points until recovered.

Eaton (Bird-Banding, vol. 5, 1934, p. 82) found in the Herring Gull on the Atlantic coast that the longest flights were invariably performed by immatures in their first autumn or winter. Although less spectacular, these flights by immature Glaucous-winged Gulls beyond the limits of the normal range of the colonies are similar in character to those of the Herring Gull.

In addition to the 4 immature birds listed above, there are 17 others from these several colonies that have made flights of from 90 to 190 miles, yet have remained within the limits of the range of these colonies as a whole, which is roughly from Chatham Point, Vancouver Island, lat. 50° 20′, to the southern end of Puget Sound. Of these 17 birds, the majority were recovered in Puget Sound; 5 were adults when recovered, of which 3 were taken in the breeding season and one in winter, over 100 miles from their birthplaces; 12 were immature, of which 8 were recovered in their first winter, 3 in their second winter and one in its third year. If we add to these the 4 birds previously listed as exceeding the normal limits of dispersal, we get 10 out of this group of 16 immatures performing in their first autumn or winter what would appear to be unusually long journeys for birds of these colonies. Two out of the remaining 6 slightly older immature birds still were far from home by midsummer of their first and second years. In fact these two birds reached points farthest north and farthest south of any of the birds recovered from these colonies to date.

It seems, then, reasonable enough to assume that birds from these colonies recovered in their second or third years, or even perhaps as adults, beyond the normal range indicated by the majority of recoveries, actually reached these distant points in their first autumn and remained in the vicinity of those points until recovered. We do know that the bird already referred to as attaching itself to a small craft in a harbor (Esquimalt, Vancouver Island) remained in the vicinity of the harbor for at least 12 months following

its arrival there in its first autumn, although in this instance the bird was but 20 to 30 miles from its birthplace.

Beyond this strange one-way dispersal of some individuals in their first autumn which appears to lack any definite directional trend, all that is indicated is a purely local dispersal of immatures in April, and of adults from their breeding grounds in September.

Why certain immature individuals depart from the normal behavior of their fellows in their first autumn is not clear. Eaton (*loc. cit.*), writing of Herring Gulls, suggests that "the pronounced tendency of immature birds to spend their first winter . . . [on the warm waters of the Gulf of Mexico] is a vestigial trait lost in adult birds," and this seems reasonable enough, although I am of the opinion that with these colonies of Glaucous-winged Gulls, the trait is lost when the bird reaches the terminus of its first autumn flight. Thus the bird becomes a permanent resident in the vicinity of that terminus. It is perhaps unwise as yet to attach any great significance to the movements of birds in their second or third years; for without the aid of colored bands, banding results alone are of little value in determining the movements of a bird between the date of its banding and that of its recovery. Continued efforts therefore seem necessary to band, not only nestlings, but more particularly adults, especially along the outer coast. Winter banding should give as good, if not better, results than the banding of nestlings, for birds of all ages would be taken, and there would be the chance of getting some "returns." Colored bands in this instance should give almost immediate results.

Cobble Hill, British Columbia, August 10, 1937.

A RECORD OF TWENTY-FIVE YEARS OF WILDFOWL SHOOTING ON THE SUISUN MARSH, CALIFORNIA

WITH THREE ILLUSTRATIONS

By EMERSON A. STONER

In the library of the California Academy of Sciences in San Francisco, there is a two-volume record of the birds killed at the Ibis Gun Club, Suisun Marshes, Solano County, California. Mr. M. Hall McAllister, who was for twenty-three years a member of the Ibis Club, and who donated the record above referred to to the Academy on May 1, 1921, suggested that, being a resident of the territory adjacent to the marsh, I would be interested in studying this record. Accordingly, I secured permission from Dr. F. M. MacFarland, President of the Academy, to withdraw these volumes from the library in order to make an analysis of their content. In view of the fact that the entries are carefully and seemingly accurately made, it is my opinion that they contain much that is of value for published record. The period covered is twenty-five hunting seasons, from September 15, 1882, to January 27, 1907.

Early History.—The Suisun Marshes had long been famous as wintering and feeding grounds for great quantities of wildfowl. As early as 1853, Heermann (Pac. Railroad Rept., vol. 10, part 6, no. 2, 1859, p. 67) referred to the great flocks of geese in the Suisun Valley where "as far as the eye could reach the sky was filled with flock after flock." Previous to the organization of the first shooting club, in 1879, the Suisun Marshes were held by market hunters, who shot over them for a period of about twenty years. They found a market in San Francisco and vicinity for the great quantities of birds which they were able to kill, transporting them ordinarily by boat to the metropolitan area some

forty miles distant. Among these early market hunters were Frank Horan, Bill Hayward, George Smith, Jim Judd, Bill Montgomery, Seth Beckwith and Jim Payne. The latter two hunters obtained the original leases from the Chamberlain estate and resold them to the several groups of sportsmen who organized the various early shooting clubs on these marshes.

The first shooting club on the Suisun marsh was the Hardland Club, organized in 1879 with ten members. This club was on Cordelia Slough, in the western portion of the Suisun marsh approximately one-half mile west of Cygnus, a station established for the convenience of hunters by the Southern Pacific Company whose railroad crosses the marsh for a distance of fourteen miles. The waters of Cordelia Slough served to feed the five ponds, as shown on the map of the club grounds (fig. 69). The ten charter members of the Hardland Club were Philip McShane, T. B. Wakefield, C. W. Randall, Matt Fuller, Joseph Grant, T. S. Butler, Louis Weinmann, W. W. Richards, Will Weinmann and John K. Orr.

The following year, 1880, another group of hunters took over the lease covering these Hardland ponds and named their organization the Canvasback Club. In 1882

Fig. 67. M. Hall McAllister at Ibis Club House with a limit bag of fifty Canvasbacks, 1904.

another change was made in personnel, and the name was changed from Canvasback Club to the Ibis Gun Club, which name it has carried since that year.

Name and Personnel of the Ibis Club.—The Ibis Club was so named, according to Mr. McAllister, because the White-faced Glossy Ibis was not infrequently found in that area in the early years, and also because the members felt that there was sort of a charm to this name, the ibis being a sacred bird in Egypt and some other foreign countries.

The three members of the Ibis Gun Club at the beginning of the record (in 1882) were W. P. Willard, Jack B. Wattles and C. G. Toland. Membership to the spring of 1887 remained at three, and thereafter was consistently limited to five. The register of

members for the twenty-five year period showed that the following enjoyed membership in the Ibis Club for a period of four years or over:

	Number Years of Membership	Dates of Membership
M. Hall McAllister	23	1884–1906
Harry Babcock	20	1887–1906
Charles P. Eells	12	1895–1906
James Otis	8	1899–1906
William Macdonough	7	1890–1896
E. Donohoe	6	1892–1897
George D. Boyd	6	1901–1906
C. J. Toland	5	1882–1886
R. Hochkofler	4	1887–1890

Other names registered in the books include fourteen who were members for a period of less than four years, and a number of guests. In looking over the list of non-members, it was noted that two well-known ornithologists were recorded as guests of the club on November 13, 1892. These were Joe and John Mailliard, the former securing eleven birds and the latter three. "J." Mailliard visited the club again on January 6, 1895, and shot ten birds.

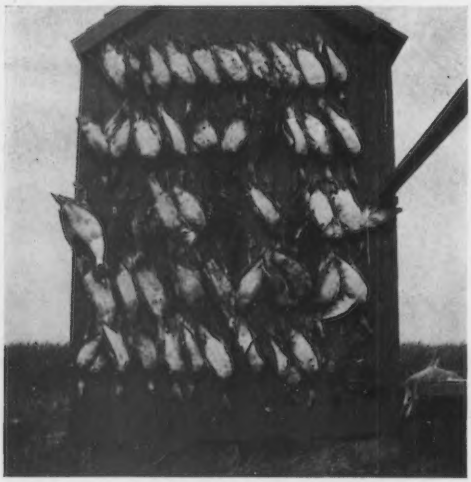

Fig. 68. Limit bag of fifty ducks killed at the Ibis Club in 1904.

Summary of Ducks Killed at the Ibis Gun Club.—My work of computing and tabulating the summary of the ducks killed was in considerable measure simplified by the fact that, at the conclusion of most of the seasons, the record showed the total of each species killed in the course of the season, the number of shoots and the average number of birds killed by each shooter in the season, and the largest daily bag for each member.

The largest single bag for a member was 154 birds, taken on October 25, 1893, by H. Babcock on Upper Surveyor Pond. His bag was 27 sprig, 8 teal and 119 widgeon. The average daily bag for each hunter per shoot was approximately twenty birds. The record shows that the limit law of not over fifty ducks per day went into effect with the

1901 season; previous to that year, there apparently was no limit as to the number of birds which might be killed.

The 36126 ducks recorded as killed at this club in the twenty-five year period were as follows.

DUCKS KILLED AT THE IBIS GUN CLUB, SOLANO COUNTY, CALIFORNIA, 1882 TO 1907

		Percentage
Sprig	10807	29.9
Widgeon	9920	27.5
Canvas-back	6981	19.3
Teal	3415	9.5
Mallard	2094	5.8
Spoonbill	1209	3.3
Black-jack (Scaup)	722	2.0
Ruddy	589	1.6
Gadwall	200	.6
Buffle-head	113	.3
Red-head	62	.2
Golden-eye	8	—
Merganser	6	—
	36126	100.0

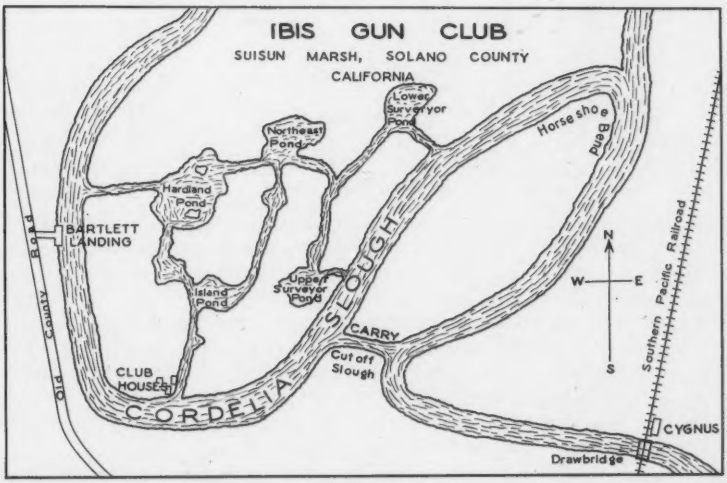

Fig. 69. Map of Ibis Gun Club, redrawn from map made by M. Hall McAllister in 1888.

A comparison of the above percentages with a similar percentage summary made by the writer (Condor, vol. 36, 1934, pp. 105–107) of a total of 20844 ducks killed on the adjacent Tule-Belle Club is of interest. The Tule-Belle Club was across the Cordelia Slough, south and east of the Ibis Club. The two records show approximately a 12 per cent larger kill of Canvas-back at the Ibis Club than at the Tule-Belle. Teal topped the Tule-Belle Club list with 30.5 per cent of the total birds killed, while only 9.5 per cent of the ducks killed by the Ibis Club were teal. Concerning these two major differences, McAllister explains in a letter to me that "the Ibis had deep-water ponds three to four feet deep, reaching to my arm pits, while the Tule-Belle had shallow water and puddle

holes one to two feet deep." The preference of Green-winged Teal for shallow water and of Canvas-backs for deep water is well known. Bent (U. S. Nat. Mus. Bull., no. 126, 1923, p. 106) says of the Green-winged Teal, "it loves to dabble in the shallow water about the edges of the sloughs, ponds, and creeks," whereas (p. 197) "the canvasback can dive to great depths and is said to be able to obtain its food at a depth of from 20 to 25 feet."

Combining the two tabulations, a "census" of 56970 birds killed at the Ibis and Tule-Belle clubs, one involving shallow ponds and the other deep-water ponds, is available. This larger figure might serve as a more satisfactory and more nearly accurate basis on which to summarize the relative abundance of waterfowl which winter on the Suisun marsh.

SUMMARY OF DUCKS KILLED AT THE IBIS AND TULE-BELLE CLUBS

	Ibis (deep water)		Tule-Belle (shallow water)		Combined (deep and shallow water)	
	Number	Per cent	Number	Per cent	Number	Per cent
Sprig	10807	29.9	5107	24.5	15914	27.9
Widgeon	9920	27.5	4153	20.0	14073	24.7
Teal	3415	9.5	6347	30.5	9762	17.1
Canvas-back	6981	19.3	1508	7.2	8489	14.9
Spoonbill	1209	3.3	1859	8.9	3068	5.4
Mallard	2094	5.8	701	3.4	2795	4.9
Black-jack	722	2.0	641	3.0	1363	2.4
Ruddy	589	1.6	8	—	597	1.1
Buffle-head	113	.3	373	1.8	486	.9
Gadwall	200	.6	104	.5	304	.5
Red-head	62		9		71	
Wood Duck	—	.2	24	.2	24	.2
Golden-eye	8		4		12	
Merganser	6		6		12	
	36126	100.0	20844	100.0	56970	100.0

Fall Migration Dates.—The opening dates of the hunting season at the Ibis Club varied from September 9 (1889) to October 1 for eighteen seasons; in the remaining seven seasons the first shooting date was October 15. The season closed at varying dates between January 4 (1884) and March 3 (1888).

It seemed to be with a feeling of pride that a member recorded the first Canvas-back (*Nyroca valisineria*) bagged in the fall. This was accomplished usually by blocking in ink the number killed, usually a single bird, and marking the entry "first can." The earliest fall date for the taking of this species in the twenty-five year period was October 6 (1889), and the latest first appearance on the records was November 2 (1891). The average fall date for the first Canvas-back was October 25.

Cinnamon Teal (*Querquedula cyanoptera*), though usually recorded in the same column with Green-winged Teal (*Nettion carolinense*), were customarily marked "Cinnamon." The Cinnamon Teal is known to be a summer resident and an early fall migrant on these marshes. However, it was not uncommon to find birds wintering on the marsh, as on December 7, 1884, December 19, 1885, December 21, 1890, January 8, 1905, and January 25, 1891.

The earliest fall record for the Buffle-head (*Charitonetta albeola*) was October 18 (1903); and the earliest "Black-jack" (Scaup) was killed on October 5 (1899).

Gadwalls (*Chaulelasmus streperus*) were on hand on several of the first shooting days, September 9, September 15 and other September dates. A hunt on September 9, 1899, showed that already there were six species of ducks on the marsh. McAllister bagged on that date Mallard (*Anas platyrhynchos*), Sprig (*Dafila acuta*), Widgeon (*Mareca americana*), Gadwall, and Green-winged and Cinnamon teal.

The Snow Goose (subspecies not named but probably most frequently the Lesser Snow Goose, *Chen hyperborea hyperborea*) was first killed in the fall as early as October 25 (1888 and 1903), and October 26 (1898), though more often first taken in November. Four hundred and eighty-eight Snow Geese, 73 "grey geese" (*Anser*), and 34 "honkers" (*Branta*) were killed in the period covered.

Fifty-one swans were recorded. The earliest fall swan was one killed November 8 (1888). In view of the rather limited amount of data recorded in the literature on swans in the San Francisco Bay region, the full record on this species is included in this report. The data on "weather," when shown, are included with November records. It is noted that Grinnell and Wythe (Pac. Coast Avif. no. 18, 1927, p. 59) record for the Whistling Swan in the Bay region: "Earliest date . . . , seasonally, is December 7 (Tomales Bay)." There are eight November swans recorded in the Ibis Club records.

DATES ON WHICH SWANS WERE KILLED AT THE IBIS GUN CLUB

December 10, 1882	2	
December 19, 1883	1	
December 23, 1883	1	
January 28, 1884	1	
February 3, 1884	1	
November 25, 1885	1	(rain 4 days, water very high)
November 23, 1887	3	(bright and cool)
December 11, 1887	2	
December 13, 1887	1	
December 18, 1887	2	
December 21, 1887	1	
December 25, 1887	1	
December 26, 1887	1	
December 28, 1887	1	(17 pounds)
December 29, 1887	1	
November 8, 1888	1	(clear and warm)
November 11, 1888	2	(wind in morning, clear and still after 10)
January 10, 1889	2	
November 17, 1889	3	(cloudy and rain)
December 1, 1889	1	
November 30, 1891	1	(18 pounds)
December 20, 1891	2	
December 27, 1891	3	(1 12 pounds, 1 14 pounds)
December 30, 1891	1	
January 1, 1892	2	
January 10, 1892	2	
January 17, 1892	1	(20 pounds)
December 1, 1895	1	
January 11, 1896	1	
January 20, 1898	1	
January 21, 1898	1	
November 26, 1902	1	(fog)
November 30, 1902	1	(clear)
December 7, 1902	1	
December 2, 1903	1	
December 27, 1903	1	
December 31, 1905	1	

Miscellaneous Data.—Mr. McAllister advises me by correspondence that the White-faced Glossy Ibis (*Plegadis guarauna*) was known as "black curlew" by hunters on the Ibis Gun Club. In 1889, September 15, he shot one of these from a flock of about a dozen.

A rather odd popular name appearing in the books is "skenk-doo," a specimen of which is recorded as shot by McAllister on Hardland pond on November 20, 1888. In reply to my inquiry, he advises me that "skenk-doo" was the popular name in these marshes for the American Bittern (*Botaurus lentiginosus*).

Yellow-legs, willets, killdeer, robin snipe, larks, blue heron and a pelican were listed as taken, but no attempt has been made to analyze these records and I have omitted such entries from the total figures. Occasionally a mammal is listed as having been killed: several rabbits and coons, an otter and a mink.

On the back fly leaf of volume one of the records are recorded the goose calls used by "Doc" Stuart, Abe Krump and Claude Kagee at Maine Prairie, Solano County, a little northeast of the Suisun marsh. These three men were recognized as among the best goose callers in the country (McAllister, Calif. Fish and Game, vol. 15, 1929, pp. 215–218). The term "brant" included both the Cackling Goose and Hutchins Goose, the former being known as the "little brant" or "cackler," and the latter as "Mexicans" or "large brant." The calls used were as follows:

Brant—*t'lick—t'lick—t'lick*—high key, sharp, not too fast at beginning, but ending in a quick roll.

White-fronted—*tad-lick—tad-lick—tad-lick—lick—lick—lick* (idem)

Snow Goose—*cwaw—caw-qua—cwaw*—repeated

"China Goose" or Ross Goose—calls like Brant—*t'lick—t'lick—t'lick*

In 1907 the Chamberlain tract comprising 5,000 acres of the Suisun marsh was sold for $20.00 per acre, or a total of $100,000.00, to Frank Maskey *et al.*, and all of the clubs were closed. It so happened that two of the three purchasers did not get a chance to fire a shot. Charley Fair was killed in July, 1907, in an automobile accident, and Joe Harvey died of pneumonia in September of the same year. After their deaths, the tract was divided up again, and four of the men who were members of the Ibis Club for the 1906 season (McAllister, Babcock, Eells and Otis) became members of the Cordelia Shooting Club.

Benicia, California, August 1, 1937.

BIOTIC ASSOCIATIONS AND LIFE-ZONES IN RELATION TO THE PLEISTOCENE BIRDS OF CALIFORNIA

By ALDEN H. MILLER

Life-zones in California are today fairly well recognized distributional divisions into which land plants and animals may be grouped. The zonal classification of a biota is inevitably subject to criticism because each organic species presents a separate problem in distribution; each responds to the numerous physical and biotic factors in different manner so that a given aggregation of species can not be bounded by any single factor or even simple group of factors of the environment. For this reason associations of plants and animals within broad zonal categories rightly receive attention as more precisely classifying the requirements and environment of species. Ultimately it is the ecologic niche, with all that that term implies in the way of significant life associates, which classifies the species biotically to the finest degree.

These familiar concepts of distribution constitute an absorbing problem when an attempt is made to apply them to conditions in the past. Our curiosity concerning the appearance of the country in former ages is one of the main reasons for study of the fossil record.

How is it feasible to piece together information bearing on this problem from fossils? The line of reasoning is as follows: (1) If in a fossil fauna the same species as live today occur, they must have required similar environmental conditions; (2) these species may have had associates that were the same, or that were similarly adapted, to those they now have; if they were known to have had a few associates like the present ones, we can assume that conditions were closely similar; (3) several associational groups along with indicator species point to a life-zone of a particular type; these also suggest the type of climate.

Several portrayals of conditions in the vicinities of the Rancho La Brea, McKittrick, and Carpinteria asphalt deposits have been offered. The excuse for another rendition of the picture of these most important Pleistocene localities is not any new method of approach, but only that more evidence has accumulated which needs to be fitted into our knowledge of the whole situation. Also, the comparison of the three faunas has not been fully developed.

Rather belatedly in the history of research on the asphalt deposits are complete studies of land birds of smaller types, and of the plants. These two elements of the biota, more than other elements thus far studied, reflect the precise environmental conditions.

They should be relied upon extensively, as should also the small rodents, were they better known.

A fundamental consideration in using modern species as indicative of past conditions is the question of constancy of habitat preference. Have species been as conservative in changing their environmental requirements as they have been in altering their structure? I am inclined to believe they have, since in general, outside of purely historical phases of their anatomy, their structure in large measure reflects their environment and mode of life. Both structure and instinct for a certain environment at least are hereditary. However, one must always be on guard in assuming identity of environmental niche for a species in the past and in the present. Much weight must be given to the degree of importance and to the flexibility of the environmental adjustments in the bird or the plant as it is known today. One could not believe that the Wren-tit of the Carpinteria was without some form of brush in which it might dwell. But the Red-winged Blackbird might have occurred even if water, which it normally seeks, were not present.

There is certain good evidence that animal and plant associations and the special requirements of modern species were similar in the Pleistocene. In the McKittrick, Mason (MS) finds a saltbush, *Atriplex polycarpa*, such as now abounds in the western San Joaquin Valley. Today this is the habitat of the Sage Sparrow in this area. Among the McKittrick bird fossils are several bones indistinguishable from those of modern Sage Sparrows. The association appears to be an old one. In the Rancho La Brea are remains of many live-oak trees. In the oak trees were Lewis Woodpeckers. At Carpinteria there were Monterey and Bishop pines; associated with these were Pigmy Nuthatches, today rigidly adherent to identical forests at sea-level in central California. One is impressed by this evidence for constancy in association and environment.

With other species the situation is different. If one knew the California Condor only from its distribution in the last fifteen years, he might conclude the species required a semi-arid mountainous country. Condors are, however, represented in Pleistocene deposits in northern California and in Florida, as also at several intervening stations in the Great Basin and Rocky Mountain states. In historic times they occurred in Oregon, the San Francisco Bay region and in other areas of diverse type. For one reason or another a withdrawal from certain zones and associations has taken place. Obviously this species is a poor zonal indicator, past or present.

Not long ago I chanced upon the unmistakable bones of a Pileated Woodpecker (*Ceophloeus pileatus*) in the La Brea. This startling occurrence would suggest a substantial coniferous forest in the area, a situation at variance with botanical evidence and with the remainder of the animal associates such as horned larks, meadowlarks, magpies and shrikes. Something does not fit, and obviously the Pileated Woodpecker is the one that is out of step with the whole company. But here are some considerations: in the last century in California (see Grinnell, Pac. Coast Avif. no. 11, 1915, p. 81) there were reported occurrences of this woodpecker at Mount Diablo and at Hollister, San Benito County, both sparsely timbered, essentially Upper Sonoran regions. Is not the Pileated Woodpecker a species that is retreating from areas of marginal habitat to regions of denser timber? Also, the rarity of the bird in the pits must be taken into account. A fossil ordinarily indicates a species of at least moderate abundance because the chances of entombment of rare species are slight. But in the La Brea such a wealth of material is accumulated that we can, as with living birds, think of species either as of normal occurrence or as strays or vagrants. Certainly the Pileated Woodpecker and the Saw-whet Owl might be classed as the latter. Hildegarde Howard (Condor, vol. 32, 1930, pp. 81–88) has shown the importance of relative abundance in a fossil fauna of this kind in determining the biotic associations and the conditions of deposition.

I propose now to consider the smaller land birds of the three asphalt accumulations that have some bearing on past ecological conditions. In the Carpinteria (Miller, A. H., Univ. Calif. Publ. Bull. Dept. Geol. Sci., vol. 21, 1932, pp. 169–194) the following species occur which are absent in the La Brea and McKittrick deposits: Pigmy Nuthatch, *Sitta pygmaea* (3 specimens); Red-breasted Nuthatch, *Sitta canadensis* (1); Wren-tit, *Chamaea fasciata* (2); Pine Siskin, *Spinus pinus* (1); Red Crossbill, *Loxia curvirostra* (2); and Fox Sparrow, *Passerella iliaca* (1). This group, especially those small perishable species that are represented by more than one individual, fairly well indicates a phase of the biotic environment peculiar to this one of the three asphalt tombs. This phase is the Monterey pine forest with its characteristic underbrush. In addition to the conifers of the forest, there was manzanita (*Arctostaphylos*) in abundance (Chaney and Mason, Carnegie Inst. Wash., Publ. 415, 1933, pp. 45–79) which doubtless served for cover for the Wren-tits. Meadowlarks were scarce; horned larks and shrikes were absent. The quail were California Quail, not Mountain Quail, which situation compares favorably with that in the coastal Transition forest today. Brown Towhees (*Pipilo fuscus*) and California Jays (*Aphelocoma californica*) both indicate the proximity, or intermixture, of Upper Sonoran. This is emphasized by the relative abundance of *Cyanocitta* and *Aphelocoma* which occur in the ratio of 2 to 11. Everyone who has considered the problem agrees that the Carpinteria represents a Transition, or near-Transition, Monterey forest such as now is found on Point Pinos, Monterey County. This closed-cone pine forest association is characteristic of the fog belt and now occurs in only slightly modified form in restricted areas on the coastal slopes west of the main coastal fault lines and on some of the coastal islands as far south as Cedros Island, Lower California (Mason, Carnegie Inst. Wash., Publ. 415, 1934, pp. 81–179).

In the McKittrick the following species appear in the pit that has a representative dry-land fauna: Bendire Thrasher (*Toxostoma bendirei*), Cliff Swallow (*Petrochelidon albifrons*), House Finch (*Carpodacus mexicanus*), Cactus Wren (*Heleodytes*, sp.), and Sage Sparrow (*Amphispiza belli*). These appear in neither of the other two locations, although the House Finch probably will be found with further study of the Rancho La Brea. *Amphispiza belli* is especially characteristic of the McKittrick area today. Other common land birds that contribute to the zonal-associational picture are Horned Lark (*Otocoris alpestris*), Sage Thrasher (*Oreoscoptes montanus*), Loggerhead Shrike (*Lanius ludovicianus*), California Quail (*Lophortyx californica*), and Burrowing Owl (*Speotyto cunicularia*).

The environment would appear to have been similar to that there now, except for local topography, were it not for the presence of several California Jays (*Aphelocoma californica*). These do not occur at McKittrick now, but are found some distance above and westward in the arid coast ranges. Mason (MS), however, finds remains of pinyon pines, indicative of a suitable plant association for this jay. A single magpie (*Pica*), possibly a straggler, is present. The pinyon forest does not now extend much north and west of Mount Pinos in southern Kern County. It would appear, then, that this particular arid interior, Upper Sonoran association extended farther north, and to lesser elevations, in the past. Proximity of such an environment to the pits might explain the occurrence of jays; the immediate environs still could have been as truly Lower Sonoran as at present. Certainly the majority of the land fauna indicates an atriplex belt as strictly Lower Sonoran in aspect as that there today.

The remains of thrashers identified as *bendirei*, rather than the expected *lecontei*, afford an interesting item of distribution. Bendire Thrashers are now largely confined to the regions east of the Colorado River, but one small breeding colony has been found (Pierce, Condor, vol. 23, 1921, p. 34) near Victorville, on the Mohave desert, San Ber-

nardino County. The species is notoriously spotted in its distribution in Arizona, especially along its northern limits. A closer faunal relation of the Mohave desert and the Kern Basin in the Pleistocene might easily have brought the Bendire Thrasher this far north, as also the Cactus Wren, if it was the same as the living species. Cactus Wrens are not found in the San Joaquin Valley at present. On the basis of Recent distribution of the Leconte Thrasher, Grinnell (Condor, vol. 35, 1933, p. 113) has pointed to the likelihood of former connections of the Lower Sonoran regions of the Mohave and San Joaquin areas, most probably by way of Walker Pass and the Kern River Valley. The Leconte Thrashers may well have been in the vicinity of McKittrick in the Pleistocene without having become entrapped.

Another unusual occurrence in the McKittrick is a small raven, indistinguishable from the White-necked Raven (*Corvus cryptoleucus*). Although now a desert species, it was less restricted in the past. It also occurred rarely in the Rancho La Brea. A notable absentee is the crow which so readily became entrapped in the other asphalt pools. Surely if it had been present in the area, it would appear as a fossil. Ravens are abundant. Crows are today absent from the arid western San Joaquin Valley, except in the river bottoms.

In summary, McKittrick and Carpinteria on opposite sides of the coast range were even more strongly contrasted zonally than now, the Carpinteria distinctly more humid with a Transition forest, the McKittrick possibly with closer approach spatially to Upper Sonoran than at present, but yet with arid, desert aspect no less extreme than that of today. The lake that provided conditions for the water-bird fauna is to be compared with the Recent desert lakes of this region.

What does the Rancho La Brea represent, an extension of the Monterey biotic province southward, a true San Diegan District environment, or one of distinctly tropical nature? I have mentioned the anomalous occurrence of a Pileated Woodpecker, and there are other rarities like the chickadee, Saw-whet Owl and Steller Jay. But the majority of the abundant species pertain to the Upper Sonoran-San Diegan fauna. Yellow-billed Magpie (*Pica nuttallii*), Western Meadowlark (*Sturnella neglecta*), California Quail (*Lophortyx californica*), California Jay (*Aphelocoma californica*), California Thrasher (*Toxostoma redivivum*), and Loggerhead Shrike (*Lanius ludovicianus*) are well-represented species of significance in this connection. Meadowlarks are much more abundant than in the McKittrick; Horned Larks are less abundant. Sage Thrashers are rare, but are common in the McKittrick. Pine-forest associates are almost absent. Significantly, we find in pit 10 (the Recent pit) an absence, or near absence, of oak-forest dependents (*Pica* and *Aphelocoma*), and an increased percentage of *Sturnella*.

The original suggestion of tropical aspect based chiefly on the presence of large raptors, many of which are now southern in distribution, is not tenable, as these forms obviously have retreated southward out of keeping with environmental changes. The suggestion that the environment corresponded to that now found somewhat to the north in the coastal oak belt was made by me (Univ. Calif. Publ. Bull. Dept. Geol. Sci., vol. 19, 1929, pp. 1–22) in an earlier study, and it was thought that climatic conditions were more humid, and if anything cooler. Since Frost's (Univ. Calif. Publ. Bot., vol. 14, 1927, pp. 73–98) study of the La Brea plant remains, Mason has reviewed the evidence and points out (see Compton, Univ. Calif. Publ. Bull. Dept. Geol. Sci., vol. 24, 1937, p. 88) that the flora is like that of the interior arid oak and juniper association of the Tehachapi region. This association is found in climates of moderate rainfall with low summer humidity. Similar conditions are now found in San Diego County and in Lower California close to, or on, the coast. As I now see it, the plants of La Brea and the bird associates did not require greater humidity than that characteristic of the site today,

but perhaps only slightly increased annual rainfall, at least locally, with temperatures similar or higher, and humidity probably less. A recent study of the shrews of La Brea by Compton (*loc. cit.*) shows that the desert-dwelling shrew, *Notiosorex*, is the dominant form.

To the southward on the coast the interior arid flora and the humid coastal close-coned pine forest typically are in closer proximity. This may have been true in the vicinity of Los Angeles. The La Brea was essentially the arid phase, perhaps protected from the coastal influence more than now by the Santa Monica Mountains wherein a Carpinteria-like biota may have existed. The Pleistocene peninsula extending from the Santa Monica Mountains northwestward, connecting the Santa Barbara Islands with the mainland, that Chaney and Mason postulate (*loc. cit.*), would have formed a protected bay to the south of it, bringing interior conditions closer to the shore line.

The only land bird that points definitely toward proximity of a coastal environment is the Northwest Crow (*Corvus caurinus*). This beach crow, unless it was very different in habits in the past, would not have wandered far from the shore. It had been entirely replaced by the Western Crow (*Corvus brachyrhynchos hesperis*) when the Recent pit containing *Homo* was open. But at no time was *caurinus* the only crow present; there were always some *brachyrhynchos*, while at Carpinteria, definitely on the coast, *caurinus* alone appears in the remains. La Brea then may have been in a marginal area with respect to the spheres of action of these two types of crow.

With respect to the northern section of the state, slightly lower zonal limits in the Shasta area are suggested by Pleistocene remains of *Dendragapus* at the 1800-foot level and by the replacement of *Aphelocoma* by *Cyanocitta* at this point where *Aphelocoma* may occur today. *Bonasa* also occurred there, which adds a humid boreal or coastal element. In Eldorado County at the 1500-foot level the presence of both *Oreortyx* and *Lophortyx* suggests marginal Transition-Upper Sonoran conditions at a point now definitely Upper Sonoran.

If we let our fancy run, and for the moment pass over the problems of time intervals within the Pleistocene, we can imagine California to have been as sharply subdivided zonally in the immediate geologic past as it is at present, with the same general distribution of zones. On the coast and in the north there was greater extension downward or southward of Transition areas, particularly a more extensive and continuous coastal pine forest. In the south, coastwise and in the interior, there was no restriction of the arid areas, but some climatic differences which favored a heavier, though arid forestation, at least locally on the coastal plane. Southern California resembled northern Lower California in abrupt contrasts, yet had certain northern components not now found in Lower California. Northern California was of more boreal aspect. The net result was a remarkable series of contrasts, especially well reflected in the biotas of Carpinteria, McKittrick and Rancho La Brea.

Museum of Vertebrate Zoology, Berkeley, California, September 14, 1937.

FROM FIELD AND STUDY

Flights of Shearwaters along the California Coast.—In the past summer large numbers of shearwaters have been seen along the coast south of San Francisco Bay. On June 12, 1937, from the new ocean shore road from Thornton to Edgemar, San Mateo County, Mrs. Parmenter and I saw at least 25000 shearwaters. Again, twelve days later, more than 1000 were seen off the San Francisco beach. In both instances the birds were moving northward.

On July 12, 1937, at 12:40 p.m., at the Cliff House, San Francisco, we sighted a line of shearwaters flying northward just seaward of buoys numbers 2 and 4 that mark the eastern side of the "south channel" to the entrance of the Golden Gate. The line was therefore between three-quarters of a mile and a mile off-shore. We did not see the end of the line to the north, however, so we do not know for how long the birds had been passing.

We decided we would head south and see how far we could see the line. We therefore followed the shore highway to Point Pedro, Shelter Cove, stopping at intervals to observe the shearwaters which were continuing north in a compact line, with numerous "rafts" where the birds were feeding. They were passing fairly close to the Point, and as we observed them with our 10x50 mm. and 8x40 mm. binoculars we had no doubt but that they were the Sooty Shearwarter (*Puffinus griseus*).

Their manner of flying, with rapid wing-beats followed by soaring or sailing, and their stiff wings were remindful of the albatross. They continually changed the angle or inclination of their sailing plane, their wing tips nearly touching the water. This manner of soaring exposed the upper and lower parts alternately so that we had good conditions for observation. From Point Pedro as far south as we could see, the line of birds was continuous and north-bound.

We continued south on the highway over Montara Mountain and picked up the line of birds as soon as we were again near the shore. From there we could see that the birds extended north to Point Pedro, so if by chance the line had been broken, there could have been only a rather short interval.

We then proceeded south to Halfmoon Bay and as far as Martin's Beach, about eight miles beyond. We reached that point at 3:53 p.m., some 3 hours and 13 minutes after the birds were first sighted off the Cliff House. It is about 30 miles from the Cliff House to Martin's Beach in a direct line by sea.

Assuming that the progress of the birds was at least 25 miles per hour, they had covered at least 80 miles in the 3 hours and 13 minutes; and as we were 30 miles from our starting point, the line of shearwaters was about 110 miles long, no account being taken of the distances the line may have extended north of the Cliff House when we first sighted it or south of Martin's Beach when we left it.

A "raft" of birds a mile long by one-eighth wide would cover 3590400 square feet. Allowing 10 square feet to a bird, there would be at least 359000 birds in a raft of those dimensions. We observed many "rafts" of varying sizes, large and small. We believe that a conservative estimate of the number of birds seen by us was at least 750000.

Since July 12, we have seen the shearwaters in diminished numbers; some were flying south and some north; by August 11 there were just a few scattered birds. Murphy (Oceanic Birds of South America, vol. II, 1936, p. 667) quotes Beck as saying that 100000 is a low estimate of the number of shearwaters one may see in the course of a single day when the migrating hordes are southward bound off the California shores.

In the course of our residence previously in Santa Barbara we several times (usually in May) saw large flights of shearwaters northward bound in the Santa Barbara Channel. In one instance a line of birds at least 30 miles in length was noted, the line being very compact with practically no rafts. Our computation of that particular line was about 300000 birds.

While on the U.S.S. Albatross some years ago, I remember vividly our steaming through an immense raft of shearwaters in the vicinity of the Aleutian Islands. The birds did not rise from the water, but flapped away from our bow, while some dove.—HENRY E. PARMENTER, *San Francisco, California, August 19, 1937.*

Nesting of the Western Robin at Redlands, California.—Inasmuch as Willett in his "Revised list of the birds of southwestern California" (Pac. Coast Avif. no. 21, 1933, p. 130) says that the Western Robin (*Turdus migratorius propinquus*) is a summer resident in mountains from 5000 to 9000 feet altitude, nesting but rarely in the foothills, the nesting of robins at Redlands, elevation 1400 feet, seems worthy of record. Robins were first noticed at Redlands in the summer in 1935. On June 19 at Smiley Park a nest holding young nearly ready to fly was found, situated about fifteen feet up in

a pepper tree. On July 17 another nest, also in a pepper tree, was found not far from the first. This nest held four young. We believe both nests were built by the same pair, as only one pair of birds was seen either time. Also, in July of 1935, a pair of robins was seen several times on the University of Redlands campus.

In the summer of 1936 we did not look for the robins where they were observed the preceding year, but a male was heard singing in June on the Redlands High School grounds. In 1937, robins were seen during May and June at all three places where previously observed. At Smiley Park two males were heard singing at the same time, and one nest was located.

Though the Western Robin customarily breeds at elevations above 5000 feet in southern California, the planting of large lawns and ornamental trees seems to have created an environment suitable for the robins at a much lower elevation.—HAROLD M. HILL and DAVID BILLINGS, *Redlands, California, August 28, 1937.*

Notes on Birds from Graham County, Arizona.—From March, 1935, to September, 1936, I was stationed at Safford, Arizona, the county seat of Graham County in the southeastern part of the state. In the course of incidental field observation during this time in that county, a total of 192 species of birds was observed. Included in this total are the following records which may be of interest:

Egret. *Casmerodius albus.* Seen at various times along, or near, the Gila River: March 5 and 26, April 9, and May 9, 1936; also December 19, 1935.

Black-crowned Night Heron. *Nycticorax nycticorax.* One seen May 4, 1935, at Allred's Pond near Safford. Apparently an uncommon species.

White-faced Glossy Ibis. *Plegadis guarauna.* Not uncommon along the Gila River and on reservoirs in the vicinity of Safford. A flock of 9 was seen on April 26, 1936; 16 on May 4, 1935; 1 on May 6, 1935; and 26 on August 26, 1936.

Zone-tailed Hawk. *Buteo albonotatus.* Seen in the Transition Zone on the Graham Mountains (7000–9000 feet) on April 3, May 9, and June 26, 1936. It very likely breeds in these mountains.

Long-billed Curlew. *Numenius americanus.* Seen twice, near the Double Circle Ranch headquarters along Eagle Creek on April 12, 1936, and at Safford on September 14, 1935. A single individual was seen in each instance.

Dowitcher. *Limnodromus griseus.* A flock of six was seen at Allred's Pond near Safford on April 26, 1936.

Black Tern. *Chlidonias nigra.* Immature birds were seen at reservoirs in the vicinity of Safford on August 7 and 13, 1936, and on September 28, 1935. Apparently this tern does not occur in the spring migration.

Arizona Woodpecker. *Dryobates arizonae.* Occurs in the scrub-oak belt on the Graham Mountains.

Tree Swallow. *Iridoprocne bicolor.* Rare; one record, April 3, 1936, in the foothills of the Graham Mountains.

Clark Nutcracker. *Nucifraga columbiana.* Common in the Graham Mountains in the fall of 1935. It possibly breeds in these mountains, as indicated by records for April 26 and June 28, 1936.

Red-breasted Nuthatch. *Sitta canadensis.* Probably a permanent resident in the Graham Mountains; seen June 14, 1936, and October 20 and December 19, 1935.

Dipper. *Cinclus mexicanus.* Seen in Wet Canyon in the Graham Mountains March 5, 1936, and December 19, 1935. The species is rare in southern Arizona.

Golden-crowned Kinglet. *Regulus regulus.* Recorded on June 7, 1936, from the top of the Graham Mountains, altitude 9700 feet.

Pipit. *Anthus spinoletta.* Seen in the vicinity of Safford on March 18, 1936, and on December 19, 1935.

Cedar Waxwing. *Bombycilla cedrorum.* Seen feeding on mulberries in Safford on April 28, 1936; also seen on October 20 and on December 19, 1935, in the Transition Zone of the Graham Mountains.

Chat. *Icteria virens.* Apparently rare; seen once in the brush along the Gila River on May 28, 1935.

Great-tailed Grackle. *Cassidix mexicanus mexicanus.* Report of the occurrence of this species at Safford was first published by the writer in the Wilson Bulletin (vol. 48, 1936, p. 48). On the date of that record (May 28, 1935) three adult birds were observed. The species was noted again on May 9 and on June 23, 1936. On the latter date juvenal birds were seen. Search during the winter at the locality in which the birds had been seen failed to reveal the species.

Lazuli Bunting. *Passerina amoena.* Apparently rare. Met with but once, on May 7, 1935, in the foothills of the Graham Mountains.

Evening Grosbeak. *Hesperiphona vespertina.* Five individuals were seen in the Transition Zone of

the Graham Mountains on May 9, 1936. These may have been either migrants or representatives of a resident subspecies.

Goldfinch. *Spinus tristis.* Seen at Safford on April 29, 1936.

Scott Sparrow. *Aimophila ruficeps scottii.* Noted on April 26, 1936, in the scrub-oak belt of the Graham Mountains.

Lincoln Sparrow. *Melospiza lincolnii.* Observed in the foothills of the Graham Mountains on April 3, 12, and 16, 1936.

Chestnut-collared Longspur. *Calcarius ornatus.* Two flocks were noted in the fall of 1935, one of 18 along the San Simon River near Tanque on October 14, and one of 17 in the Whitlock Valley on the 19th of that month.—GALE MONSON, *Gallup, New Mexico, July 24, 1937.*

An Overlooked Synonym of the Chestnut-backed Chickadee.—Having learned that birds had been collected in California in the 1850's and sent abroad by, or for, one Carl Lundahl, I started enquiry as to the possibility that this man might have written something about those birds, or that someone else might have based an article on them. One clue led to another, and eventually I got into productive correspondence with Professor Pontus Palmgren, of the Zoological Museum at the University of Helsingfors, Finland, who proved to know something about Lundahl.

Dr. Palmgren was unable to find anything in the Finnish literature writen by Lundahl concerning Californian birds; indeed, it would appear that the latter published but one small paper on birds. This paper, however, turns out to bear directly on Alaskan ornithology—hence of interest to American students. The article in question has, to my knowledge, never before been cited in American literature, and since it contains a new name for an American species, its existence and purport need to be made known. The series containing the article is a rare one; I was unable to locate it in any western library. Professor Palmgren most kindly sent me a photostat copy of the article, and furthermore he freely granted me permission to publish upon it, though it was solely his own discovery.

The article in question is the first in a new series, of title page as follows: Notiser | ur | Sällskapets pro Fauna et Flora Fennica | Förhandlingar. | Bihang till *Acta Societatis Scientiarum Fennicæ.* | Första Häftet. | Helsingfors, | Hos A. W. Gröndahl. | 1848. The article, occupying pages numbered 1 to 6, is written in the Swedish language. Its full title (at top p. 1) is: Anmärkingar om tvenne | med Parus sibiricus *Gmel.* | förvexlade Mes-arter, | af | Carl Lundahl. Translated (by Professor Palmgren) this title is: "Remarks on two species of *Parus* which have been confused with *Parus sibiricus* Gmelin." Reference is made in the text to accompanying drawings, plate I, figures 1 and 2; but these are not included with the photostat copy. Figure 2, Professor Palmgren writes me, is an excellent colored likeness of *Parus rufescens* Townsend.

Through the effort of my junior colleague Dr. Seth B. Benson, and of his friend Mr. Robert Erickson, a full translation of the article is now available in typed form to accompany the photostat in the files of the Museum of Vertebrate Zoology. This translation from the Swedish was most generously performed by Mr. Oscar A. Anderson, of Berkeley, who took special pains to secure accuracy in technical matters.

In the first and greater portion of the article, its author, Lundahl, discusses the characters and nomenclature of the chickadees of Lapland and other northern parts of Eurasia. The portion of primary interest to Americans begins on page 5, whereon lines 4 to 6 are in latin, as follows: *Parus ferrugineus* mihi. | P. capite et collo supra, maculaque gutturis magna dilatata | fuliginosis; dorso et uropygio ferrugineis; cauda emarginata.

Then follows a long paragraph, in Swedish, giving measurements and details of coloration; then a short one concerning generic affinities; and finally a paragraph of special purport. This reads, translated literally by Mr. Anderson, as follows: "*P. ferrugineus* is common on the Sitkha and in the territory around Ochotsk; from these places a teacher at the University, Herr Dr. F. Sahlberg, has brought over thirty specimens which I have had opportunity to examine. I have not been able to find any difference between the individuals of North America and Siberia."

Since the Chestnut-backed Chickadee has never been found in Siberia, to this extent a mistake was made—maybe previously, in labelling the specimens received from the well-known zoological collector Dr. R. F. Sahlberg. Evidently Lundahl was totally unaware of the previous description of this species by John K. Townsend, for he says (top p. 5) [translated] " . . . I have so far nowhere seen this species described." Sahlberg did his collecting in Alaska in 1839 and (or) 1840.

Thus we have *Parus ferrugineus* Lundahl (1848), type locality, Sitka, Alaska, to keep track of as an additional synonym of *Parus rufescens* Townsend (1837), type locality, Fort Vancouver, Washington. An already listed synonym of the species is "*Parus sitchensis* Kittlitz" (1836), a "nomen nudum" according to Ridgway (Birds N. and Mid. Amer., vol. 3, 1904, p. 418).—J. GRINNELL, *Museum of Vertebrate Zoology, Berkeley, California, June 18, 1937.*

The Sage Thrasher in Saskatchewan.—On June 24, 1933, Mr. Chas. F. Holmes, of Dollard, Saskatchewan, took a male Sage Thrasher (*Oreoscoptes montanus*) in the valley of the Frenchman River, near Eastend, at a point about thirty miles north of the International Boundary. On June 12, 1934, Mr. Holmes took a male and a female, and soon after found a nest containing one egg, presumably of this species. Mr. Fred Bard, of the Provincial Museum, Regina, visited the writer's ranch in the spring of 1934, and took a male Sage Thrasher on June 11. Next day we went to the same spot, a little sage-brush covered flat close by the river. We were driving in a single-horse buggy, expecting to traverse some rough country. On alighting from the buggy, Mr. Bard almost stepped on a female thrasher as she flushed from her nest in a sage-bush, containing five eggs. In the course of the next few days, Mr. Bard saw two or three more pairs of thrashers and found another nest. On June 20 the writer came upon yet another nest with five newly-hatched young. Whereas all the other nests were located in the sage-brush close to the river, this one was placed in a clump of wild rose some distance up from the river in a small ravine. On August 22 two thrashers, apparently young birds, visited the ranch house.

In 1935, no thrashers were seen here in June, but on July 12 a bird was noted singing, and again on July 17. No nests were found. In 1936, hot and dry though the entire summer proved to be, we saw no Sage Thrashers at any time. This summer (1937) two pairs were seen by Mr. Holmes on May 24, and one bird was heard singing by myself on June 26.

In Montana the Sage Thrasher is listed as "a rare summer resident" by Saunders (Pac. Coast Avif. no. 14, 1921, p. 154). The recent increase and northward extension of range is perhaps due to the succession of dry summers that have been experienced on the plains. When the hoped-for wet years come again, it may be expected that the Sage Thrasher, welcome indeed for its glorious song, will cease to appear.—LAURENCE B. POTTER, *Gower Ranch, Eastend, Saskatchewan, August 6, 1937.*

The Tibiotarsus of the Fossil Bird Bathornis veredus.—The type specimen of *Bathornis veredus* (Wetmore, Proc. Colorado Mus. Nat. Hist., vol. 7, 1927, p. 11, figs. 19–24) is the distal portion of a metatarsus collected by Philip Reinheimer from the Chadron beds of the Oligocene while working for the Colorado Museum of Natural History in the Trigonias Quarry of Weld County, Colorado. Later, M. V. Walker, collecting with C. W. Gilmore for the U. S. National Museum, secured the distal end of a metatarsus in Titanothere beds eleven miles northwest of Crawford, Nebraska, that I also have identified as of this species. This has been the known record of the species to date.

Recently, Dr. Glenn L. Jepsen of Princeton University has sent to me for examination a left tibiotarsus (fig. 70), lacking the head, that after careful comparison I have identified as representing *Bathornis veredus*. This bone, Princeton University Museum no. 14400, was collected in the Middle Titanothere (Chadron) deposits of the Oligocene on Indian Creek, South Dakota, in June, 1929, by Glenn L. Jepsen.

It will be recalled that in Oligocene deposits near Torrington, Wyoming, under exploration by the Museum of Comparative Zoology, there has been found a considerable number of fossil bird bones, the majority of which represent a species that I have named *Bathornis celeripes* (Wetmore, Bull. Mus. Comp. Zool., vol. 75, 1933, p. 302, figs. 6–14). The metatarsus of this form is similar to that of *B. veredus* but is decidedly smaller. Of *celeripes* I have examined sixty-five specimens of the lower end of the tibiotarsus. The tibiotarsus collected by Dr. Jepsen is similar in form to that of *celeripes*, but is much larger.

In sixteen specimens of the metatarsus of *Bathornis celeripes* the transverse breadth across the trochleae ranges from 14.7 to 16.5 mm. In the type of *B. veredus* this same measurement is 19.7 mm. Nineteen examples of *Bathornis celeripes* have the transverse breadth across the condyles of the tibiotarsus from 12.5 to 14.8 mm. This dimension in the tibiotarsus in the Princeton collection is 18 mm. The proportionate difference in size of the metatarsi in the two species is similar to that existing between the tibiotarsus of *celeripes* and the tibiotarsus here under study. In view of this agreement, the bone from Princeton is identified as from *Bathornis veredus*.

Following is a brief description of pertinent characters evident in this bone: Outline of external condyle, viewed from the side, rounded anteriorly and flattened distally (the posterior flange broken away); internal condyle, viewed from the side, with anterior portion narrowed and projected forward considerably beyond the level of the shaft, the lower margin flattened (posterior flange broken); intercondylar fossa broad and deep, with the internal condyle rising abruptly from it, the margin of this condyle being thickened to produce a slight notch; boundary margin of the external condyle sloping in a rounded curve; articular surface shallowly concave; tendinal bridge broken away, but evidently strong, with a prominent angular projection on the external margin; shaft relatively slender, flattened in front and rounded behind.

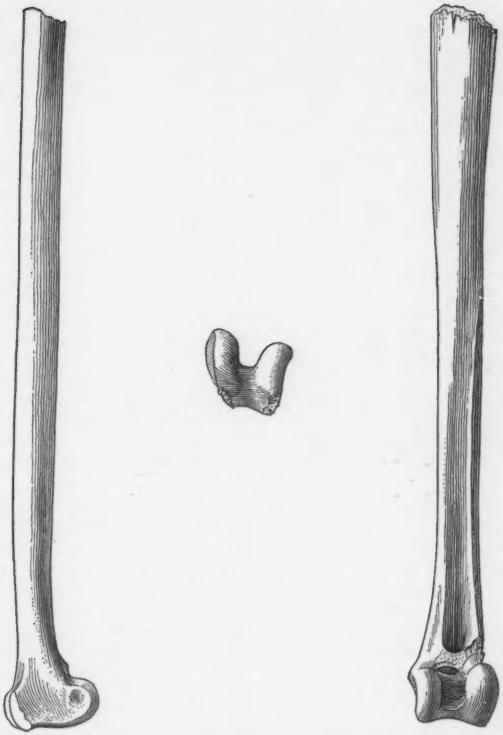

Fig. 70. Left tibiotarsus of *Bathornis veredus*, ×¾.

Transverse diameter across trochlea 18.0; smallest transverse diameter of shaft 8.6 mm. Bone completely fossilized, ivory white in color.

The drawings illustrating this specimen have been made for me by Sydney Prentice.—ALEXANDER WETMORE, *U. S. National Museum, Washington, D. C., July 14, 1937.*

Two Sea-bird Records for Southern California.—On January 28, 1937, while walking on the beach north of La Jolla, California, in search of birds which might have perished and been washed ashore in the recent off-shore storms, I found three Paroquet Auklets (*Cyclorrhynchus psittacula*). Two of the birds were badly mutilated and were recognizable only by the unusual and distinctive shape of the mandibles. The third specimen was not in as bad condition as were the first two, although it had evidently been in the water several days and on the beach at least one day; decomposition made the determination of sex impossible. However, it was not beyond preservation and is now specimen number 326 in my collection. Mr. L. M. Huey of the San Diego Society of Natural History identified the bird by comparing the skin with specimens in the museum collection.

Upon investigation I find that the southernmost record of *Cyclorrhynchus psittacula*, to date, is that of fourteen specimens taken by Beck off Point Pinos, Monterey County, California (Grinnell, Pac. Coast Avif. no. 11, 1915, p. 18). The three specimens found on January 28, 1937, extend the winter range of this species some four hundred miles southward, and to a point within twenty miles of the Mexican border.

It may be of interest also to record that on July 28, 1936, while searching for sea birds about one mile off La Jolla, I collected an immature female Man-o'-war-bird (*Fregata magnificens rothschildi*). Although the records of these birds this far north are not uncommon, I believe they may still be considered wanderers north of their regular range. Before it was collected, the bird was observed while it poised gracefully several times before plunging for fish.—KARL W. KENYON, *La Jolla, California, April 27, 1937.*

The Cassin Kingbird in San Joaquin County, California.—A slight northward extension of the known summer range of the Cassin Kingbird (*Tyrannus vociferans*) in California is involved in the occurrence of a pair of these birds on July 15, 1937, in Lonetree Canyon, 9 miles south of Tracy, San Joaquin County. A large company of Western Kingbirds (*Tyrannus verticalis*) was found about a group of eucalyptus trees and tobacco bushes near the mouth of the canyon on this date. In the same grove, but not mixing intimately with the Westerns, were the Cassin Kingbirds. They were at once recognizable by their distinctive notes. Mr. Ernest I. Dyer and I verified plumage characters by repeated observation.

Dawson (Condor, vol. 18, 1916, p. 27) reported Cassin Kingbirds from western Merced County, and similar records are known from San Benito and Santa Cruz counties. It is not unexpected that the species should extend northward along the arid coast ranges on the west side of the San Joaquin Valley to the point indicated by the present record. In my experience the species is by no means restricted to the Lower Sonoran Zone, and in Arizona it is principally of Upper Sonoran occurrence. Yet it seems to belong to that considerable aggregation of distinctly austral species which reach their northern limits of tolerance at about this point in the coast region.—ALDEN H. MILLER, *Museum of Vertebrate Zoology, Berkeley, California, August 29, 1937.*

A Herring Gull Record for Utah.—On April 27, 1937, Ralph C. Winslow found the carcass of an unusually large gull on the dike of unit 5 of the Bear River Migratory Bird Refuge, in Utah. Though the bird was too decayed for study-skin purposes, it was tentatively identified as a Herring Gull (*Larus argentatus smithsonianus*). Dr. J. S. Stanford, of the Utah State Agricultural College, preserved the carcass in formalin and shipped it to the Bureau of Biological Survey, Washington, D. C., where Dr. Clarence Cottam and Dr. H. C. Oberholser verified the original identification. This is apparently a new record for the state, as there are no notes at any of the state's colleges or in the files of the Biological Survey to indicate its occurrence in this region. Since this note was submitted for publication, another specimen was found on the refuge.—WILLIAM H. MARSHALL, *U. S. Biological Survey, Brigham, Utah, July 20, 1937.*

The White-winged Junco in Arizona.—Previous records of the White-winged Junco (*Junco aikeni*) appear to be all from points east and north of Santa Fe, New Mexico. In the past winter, however, the species was found to have invaded Arizona.

The first record was obtained November 21, 1936, when Phillips, working with Jenks, took a young male at Brentwood Ranch, Apache County, 35 miles south of Springerville. The bird was feeding with a large flock of juncos of various species in a field grown to weeds and sunflowers in the yellow pine belt (Transition Zone). No others were seen during the winter in the White Mountains region.

Hargrave identified several White-winged Juncos on January 21, 1937, the date when a feeding station was established at the new building of the Museum of Northern Arizona, three miles northwest of Flagstaff, Coconino County. This locality is also in the Transition Zone. No observations of birds had been made at this location since December 11, 1936. Traps were set on January 23, and shortly after a male (Z8.944) and a female (Z8.945) White-winged Junco were trapped, separately, and collected. On the 25th two more were trapped; one was given a band (number 36–2324) and the other, a female (Z8.496), was collected. Several times on the 26th an individual *aikeni* was observed. Number 36–2324 was recaptured on the 27th, and again on the 28th, when an unbanded *aikeni* was seen at the same time. Later in the morning two unbanded White-winged Juncos were seen together at close range.

From January 29 to February 26 juncos of this species were seen irregularly. Never more than two were seen at a time. Another male (Z8.947) and a female (Z8.971) were trapped and collected.

The records of *Junco aikeni* in Arizona may be summarized: The first individual was seen and collected on November 21, 1936. The species wintered in the state, remaining until February 26. At least seven individuals were recorded during this period, one bird banded and six specimens collected, five of which are in the collection of the Museum of Northern Arizona.

During the period of observation, from January 21 to February 24, 1937, the ground was deeply covered with snow, there being more than six feet on the level. Also, the weather was extremely cold during most of this time and once the temperature was 35 degrees below zero Fahrenheit. Under such conditions the feeding station was a boon to juncos, and many individuals were banded. *Junco hyemalis* was well represented, as also were *J. caniceps* and *J. oreganus*. The great variety of species present during the stay of *aikeni* gave an excellent opportunity for a comparative study of similar appearing birds. Of those species present, *aikeni* alone was new, so that especial attention was paid to its appearance in the field. The comparative results were both striking and surprising, inasmuch as *aikeni* has generally been likened to *hyemalis*.

Miller (Bird-Lore, vol. 38, 1936, p. 430) has stressed similarities in the color and markings of *aikeni* and *hyemalis*. In the field no difficulty was encountered in identifying *hyemalis* or *aikeni*. *Hyemalis* and *oreganus* were dwarfed in comparison with *aikeni*. However, it was sometimes difficult to distinguish *aikeni* from *caniceps*, since at certain angles the two species appeared the same. The gray of *aikeni* and *caniceps* in the field also appeared the same, but in size *aikeni* more closely resembled the race *Junco caniceps dorsalis*, also present at the station in numbers. Frequently, however, the row of white spots on the wing of *aikeni* were conspicuous and together with size were diagnostic. It is Hargrave's opinion that in life *aikeni* much more closely resembles *caniceps* than it does either *hyemalis* or *mearnsi*, and that any competent observer familiar with the species mentioned here can properly distinguish all under normal field conditions.

The familiarity with these species resulting from the recent favorable conditions for comparison permits the statement that in handling several thousand juncos at the Museum station since 1931 Hargrave does not believe that *Junco aikeni* has been previously banded there.—Lyndon L. Hargrave, Allan R. Phillips, and Randolph Jenks, *Museum of Northern Arizona, Flagstaff, Arizona, March 14, 1937.*

Three New Records from Bryce Canyon, Utah.—In the spring and summer of 1937 there were observed three species of birds not previously reported from Bryce Canyon National Park, Utah.

White Pelican. *Pelecanus erythrorhynchos.* On June 4 I saw a flock of 14 flying over the park in a southerly direction. When first seen, they were flying low and circling about, but they soon gained altitude and flew directly south beyond my vision.

Western Willet. *Catoptrophorus semipalmatus inornatus.* On April 20 and 21 a shore bird was seen by K. H. Flewelling and Donald DeLeon near the head of East Creek, 8775 feet altitude. At that time practically all of the plateau area of the park was covered by snow, but a small area of mud had been exposed on East Creek when repairs were made in a pipeline. The bird remained on or near this mud during much of the time that it was observed, and would fly but a short distance away when disturbed. On April 23 it was found dead, apparently killed by a hawk or owl. It was identified as a Western Willet, but was not preserved, being in poor condition. Willets have been noted in the surrounding territory in spring and fall migration. Their recurrence within the park boundaries is to be expected only at rare intervals, owing to the dryness of the area.

Nevada Savannah Sparrow. *Passerculus sandwichensis nevadensis.* In the course of the limited banding operations carried on at Bryce, we banded two of these sparrows at the museum, which is located in a sparse stand of yellow pines with open meadows nearby. On July 31 the first one was banded, no. 36–113265; on August 3 another was banded, no. 37–43947.—C. C. Presnall, *Zion National Park, Utah, August 16, 1937.*

NOTES AND NEWS

The Index to Volume XXXIX of the *Condor*, which concludes the present issue, is the work of Miss Selma Werner. To her the editors hereby express their gratitude for this essential service well performed. Again, we may properly remind ourselves that the publication function of the Cooper Ornithological Club is one that is maintained through abiding interest and sacrifice of time on the part of a considerable number of the Club's members, not just a very few. —J. G.

Frank Stephens, pioneer naturalist and Honorary Member of the Cooper Ornithological Club, died at San Diego on October 5, 1937. He was born in Livingston County, New York, April 2, 1849, hence had passed his 88th birthday; he came to California in 1876; had been a Cooper Club member since 1894. In 1918 (Condor, vol. 20, pp. 164-166, portrait-photo) Stephens, as result of much editorial urging, published an autobiography which gives the main facts concerning his early career. He regularly attended the annual meetings of the Club whenever held south of Tehachapi, the last one being that of April 17, 1936, in Los Angeles.—J. G.

The compilation of indexes to the literature in various fields of science is an ever growing responsibility because of the ever augmenting mass of publication. In American ornithology this growth phenomenon is evidenced in the successively increased sizes of the 10-year indexes as already printed, of the *Auk* and of the *Condor*. The size of the job keeps growing, and the amount of energy, ornithological knowledge and judgment required of the compiler, if it could be measured, doubtless would show similar trend. The third 10-year index to the *Condor*, issued in 1931, was compiled by George Willett; the fourth 10-year index to this journal is now in process of preparation by John McB. Robertson (see note in *Condor*, 1937, page 93). The fourth 10-year index to the *Auk*, issued in 1934, was the work chiefly of Harry S. Swarth, and the same compiler had undertaken to do the fifth *Auk* index. Indeed he had well launched himself upon this new project when he died, in 1935. Then, Harry Harris, well qualified by previous indexing experience, consented to take over the job; but failing eyesight on his part has compelled him to relinquish the undertaking. Now, by appointment of President A. C. Bent, of the American Ornithologists' Union, George Willett has undertaken to carry forward the compilation of the fifth ten-year index to the *Auk*. This is, of course, a service not only to the A.O.U. but, when completed, to ornithologists the world over, to whomever will seek clues to the informational content of the volumes of that journal for the period 1931 to 1940, inclusive. —J. G.

As one of its major objectives, "the publication of ornithological knowledge," the Cooper Club has issued a long list of contributions in its Pacific Coast Avifauna series. These, previously, have been mainly in the nature of state lists, faunal reports, indexes, and bibliographies. The last one to be issued, however, number 25, "The Natural History of Magpies," differs in kind of topic. It was hoped that, by thus increasing the scope of this series, a wider interest would be aroused and the avifauna series would be made to reflect more closely the trend of activities on the part of the present-day membership of the Club and on that of other bird students. Features of the new avifauna, aside from the text of chiefly natural history bearing, are a colored frontispiece, special full-tone reproduction of some of the illustrations, and cloth binding for part of the copies. The report combines items selected from thousands of publications with the results of direct field study of the Californian yellow-billed magpie and of the black-billed form, of western North America. Comparisons are made between these and others of the seventeen kinds of magpies known to inhabit the northern hemisphere. The author, Jean M. Linsdale, has done an admirable and exhaustive piece of work of its kind. The publication of the results of his efforts was made financially possible by a number of Cooper Club members who were convinced that this type of research would be widely welcomed. Copies of the book are obtainable, unbound or bound, as desired, from W. Lee Chambers, 2068 Escarpa Drive, Eagle Rock, Los Angeles.—J. G.

There is probably no naturalist better informed as to the general condition of wild-life in northern North America today than Dr. Rudolph M. Anderson, who is Chief of the Division of Biology, National Museum of Canada. A recent well-considered utterance of his bears authoritatively on current discussions of factors known or supposed to have had to do with water-fowl decimation. In a publication entitled "Canada's Western Northland" (King's Printer, Ottawa, 1937, p. 120), Dr. Anderson says: "It may be well to controvert the inherited folk-lore as well as propaganda prevalent among sportsmen in more southern districts (in Canada as well as in the United States) that the game birds, particularly swans, geese, ducks, and shore-birds, are being exterminated by Eskimos and Indians somewhere in a vague North Country. The average native is not a hunter for sport, and in most districts

ammunition is too expensive to waste on small returns. The territory is so large that only a relatively small section is hunted frequently, and there is virtually untouched breeding ground in every district."—J. G.

The quality of certain illustrations appearing in the *Condor* in the last two years has been enhanced by aid rendered through the Works Progress Administration, Project W. P. No. 6079-5797. Maps constituting figures 4 and *32 in volume 38, and figures 7, 14, 21, and 69 in volume* 39 have been reworked from the originals by this agency. Thus, good appearance and clarity have been insured, and the end-product of research has been made that much better.—A.H.M.

A tendency manifest in present-day ornithological activity is apparently somewhat away from systematics and faunistics, but at any rate definitely toward studies of the *living* birds. *More and more qualified ornithologists are centering attention each upon a single species, or* upon a small, nearly related group of species. And it is the *living* bird or population that is being concentrated upon, through disciplined observation in the field, supplemented, in some instances, by such techniques as banding. We think in illustration at the moment, of the following projects under way, some of them already published upon in part, but none, of course, ever to be considered as absolutely completed: Margaret M. Nice on song sparrows; Herbert Friedmann on cowbirds; Mary M. Erickson on wren-tits; Ernest I. Dyer on California thrashers; Barbara D. Blanchard on white-crowned sparrows; Jean M. Linsdale on magpies; the Micheners on mockingbirds; Anders H. Anderson on cactus wrens; E. Lowell Sumner, Jr., on California quail; Harry W. Hann on the oven-bird (reported upon in September, 1937, issue of *Wilson Bulletin*); Gayle Pickwell on horned larks; William E. Ritter on the California woodpecker; John T. Emlen, Jr., on crows; Elmer C. Aldrich on the Allen hummingbird; Howard H. Twining on the Sierra Nevada rosy finch. And doubtless there are others. Choose your bird!—J. G.

MINUTES OF COOPER CLUB MEETINGS

NORTHERN DIVISION

JULY.—The regular monthly meeting of the Northern Division of the Cooper Ornithological Club was held on Thursday, July 22, 1937, at 8:00 p.m., in Room 2503 Life Sciences Building, Berkeley, with President Kinsey in the chair and sixty-four members and guests present. Minutes of the Northern Division for June were read and approved. Minutes of the Southern Division for June were read.

The recording secretary made known the fact that large numbers of birds were meeting death by drinking at the cyanide tank of the Gold Crown Mine, within the Joshua Tree National Monument, near Twentynine Palms, California, and was authorized to write to the operators of the mine, protesting this condition.

The meeting was opened to field observations. Mr. Kinsey reported the capturing, in a Verbail trap, of a Spotted Owl, a species rare in Marin County. He also told of two pure albino Linnets which were taken from the nest and successfully reared at a local pet store. Another member mentioned having seen a Linnet with white markings on the tail. Miss Stedman told of two Cardinals, brought from Mexico, which had been in captivity in Oakland for a year and a half, and which were in good color and full song. Mr. Kinsey added that the color of the plumage of Cardinals and certain other species is often enhanced when the birds are kept in sunny aviaries. Mr. Grinnell cited a paper relating to temperatures of birds, by Dayton Stoner of the New York State Museum at Albany. His work indicates wide variation in temperature within a single species, or even in a given individual under different conditions. Mr. Alden Miller reported that his summer-session class, in seeking possible effects of recent extensive destruction of birds by oil from a submerged tanker, had found the Murre colony at Point Reyes to be as large this year as in previous years.

As speaker of the evening, Mr. Loye Miller, of the University of California at Los Angeles, gave a delightful acount of his recent observations upon the Black-footed Albatross, off the coast of southern California. He prefaced his remarks by several examples of cycles of population among birds. The studies of the albatrosses were made from the State Fisheries ship "Blue-Fin," in use for field work by the Scripps Institute of Oceanography at La Jolla. Interesting discussion followed the talk, Mr. Miller answering a number of questions from members.

Adjourned.—FRANCES CARTER, *Recording Secretary.*

AUGUST.—The regular monthly meeting of the Northern Division of the Cooper Ornithological Club was held on Thursday, August 26, 1937, at 8:00 p.m., in Room 2503 Life Sciences Building, Berkeley, with eighty-three members and guests present. President Kinsey turned the chair over to Vice-president Cain, who presided for the remainder of the meeting. Minutes of the Northern Division for July were read and approved. Minutes of the Southern Division were read. Names proposed for membership were: Victor H. Cahalane, Wildlife Division, National Parks Service, Washington, D. C., by J. M. Linsdale; Ian McTaggart Cowan, Provincial Museum, Victoria,

B. C., by J. M. Linsdale; Paul Atwood Harvey, 1515 Spruce Street, Berkeley, by J. Grinnell; E. Whitney Martin, 525 Lincoln Avenue, Palo Alto, California, by Wilbur V. Henry; Rosa Lee Moose, 3170 Valencia Drive, San Bernardino, California, by Alden H. Miller; Mrs. F. W. Pleas, Woodside, Route 1, Box 255, via Redwood City, California, by Isabel McCracken.

The secretary outlined the content of a letter from the Bureau of Biological Survey, in answer to the resolution regarding poisoning of native wild mammals which was passed by this club at its June meeting and sent to the President of the United States. A letter was also received from the Secretary to the President, acknowledging receipt of the resolution and stating that it had been referred to the Biological Survey.

Field observations were contributed by many members. Miss Werner told of having seen a female American Merganser followed by 16 ducklings, at Fallen Leaf Lake. Dr. Haley had seen a Surf-bird on the slopes of Mount McKinley in the interior of Alaska. Mr. Hargreaves reported Caspian Terns at Clear Lake, about the middle of August. Three caged Arizona Hooded Orioles were exhibited by Mr. Brock, two immature birds trapped on Wildcat Creek, August 1 and 8, and a young male in the dull first breeding plumage secured in San Leandro on May 15. Observations given by other members would indicate that this species is becoming more common in the Bay area. Miss Nold had noted a nest of the White-crowned Sparrow with three eggs, on August 3, north of Yosemite Valley. Mr. Cain recounted some observations made with the Boy Scouts during the summer at Diamond Camp, Oakland, and in the Yosemite region. A so-called "marmot circus" witnessed by a large group of boys on the Tioga road was described. Mr. Covell reported two pairs of Ospreys, July 12, on the Eel River near Garberville.

The speaker of the evening was Mr. Edmund Heller, Director of the Fleishhacker Zoo, San Francisco. In presenting his subject, "Birds of the Zoo," he revealed some of the problems confronting the director of a zoo, which is appraised by the public chiefly in terms of its "circus animals." A great many types of birds, including nearly every group except the finches, are classified by zoo men as "soft-bills" and usually cannot be kept successfully. The Peacock enjoys the greatest popularity. Mr. Heller read excerpts from some highly entertaining pamphlets written by him for visitors to the Milwaukee Zoo and dealing with myths surrounding the Road-runner and the Australian Laughing Jackass, both popular zoo residents. In concluding his talk, Mr. Heller showed pictures of many of the birds most frequently kept in zoos.

Adjourned.—FRANCES CARTER, *Recording Secretary.*

SOUTHERN DIVISION

JULY.—The regular monthly meeting of the Southern Division of the Cooper Ornithological Club was held on Tuesday, July 27, 1937, at 8:00 p.m., at the Los Angeles Museum, Exposition Park, Los Angeles, with President Little in the chair and thirty-five members and guests present. Minutes of the Southern Division for June were read and approved. Minutes of the Northern Division for May and June were read by title only. The name of W. E. Selbie, Mammoth Lakes, Mono County, California, was proposed for membership by M. C. Badger.

George Willett announced that Alfred M. Bailey, Director of the Colorado Museum of Natural History, Denver, would be the speaker for the August meeting, if the date could be advanced to Wednesday, August 25. It was moved, seconded, and carried that the August meeting be held on that date, and everyone was urged to be present and bring interested guests.

Mr. Charles H. Feltes of Modesto was introduced and read a paper on "Field and banding notes on the Texas Nighthawks." He then showed a series of slides taken of one of the nests under observation. The pictures brought out very clearly the protective coloration of the eggs in the nest, of the young after they were hatched, and of the old bird sitting on the eggs.

Adjourned, SIDNEY B. PEYTON, *Secretary.*

AUGUST.—The regular monthly meeting of the Southern Division of the Cooper Ornithological Club was held at the Los Angeles Museum, Exposition Park, Los Angeles, on Wednesday, August 25, 1937, at 8 p.m., with President Little in the chair and about one hundred and fifty members and guests present. Owing to the length of the program, the regular routine business was dispensed with and only proposals for new membership were read. Names proposed were: Charles Champion Vandervort, Laceyville, Pennsylvania, by John McB. Robertson, and Elmer Paquette, Santa Paula, California, by M. C. Badger.

George Willett was called on to introduce the speaker of the evening, Alfred M. Bailey, Director of the Colorado Museum of Natural History, Denver, Colorado. Mr. Bailey then showed several excellent reels of motion pictures of birds taken in different parts of the United States, and told of many incidents that occurred in their filming. Especially striking were the reels showing birds in natural colors. Sage Grouse on their strutting grounds, White-faced Glossy Ibis at their nests in the marshes, Golden Eagles building their nests, Western Grebes with young just hatching, and Chestnut-collared and McCown longspurs at their nests on the prairie were some of the subjects of especial interest that showed Mr. Bailey's great ability as a wild-life photographer.

Adjourned.—SIDNEY B. PEYTON, *Secretary.*

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THE ROYAL AUSTRALASIAN ORNITHOLOGISTS' UNION was founded in 1901 with the object of popularizing the study and protection of native birds. It issues a quarterly journal, The EMU (illustrated with colored and half-tone plates), wherein records of results of scientific research in ornithology and interesting articles dealing with bird-life in Australia are printed. It also issues The Official Check-list of Australian Birds (2d edition), price 5/6d posted. Membership in the Union is £1/1/–, per annum, payable in July in advance. Write for particulars to the HON. SECRETARY, *170 Latrobe Street, Melbourne.*

EXCHANGE—I should like to receive lists from those having first class, well-labeled, bird skins for exchange. I can also use a few sets of eggs, as ducks with down, hummingbirds with nests, etc. I have for sale a number of well-prepared mammal skins.—ALEX. WALKER, *Route 1, Box 267, Tillamook, Oregon.*

WANTED—North American Fauna 25 (Texas). Will pay any reasonable price for a useable copy, or can offer N. A. Fauna 39 (*Thomomys*) in exchange.—W. B. DAVIS, *Department of Wild Game, College Station, Texas.*


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